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EXAMINER	
GODBOLD, DOUGLAS	

ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
10/22/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/731,929	Applicant(s) KEMP ET AL.	
	Examiner DOUGLAS C. GODBOLD	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-9 and 12-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9 and 12-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to correspondence filed July 17, 2008 in reference to application 10/731,929. Claims 1, 2, 4-9, and 12-15 are pending and have been examined.

Response to Amendment

2. The amendments filed July 17, 2008 have been accepted and considered in this office action. Claims 1, 9, and 12-15 have been amended, and claims 3 and 10-11 have been cancelled.

Response to Arguments

3. Applicant's arguments filed July 17, 2008 have been fully considered but they are not persuasive.

4. With regards to applicant's arguments, see Remarks pages 7 and 8, that Lee does not teach absolute loudness, these arguments are moot in view of the new grounds of rejection.

5. With regards to applicant's arguments, see Remarks page 9, that Brandstein does not teach "absolute loudness," the examiner respectfully disagrees. Although "absolute loudness" is not specifically disclosed, source location (pp. 3-5) and the relationship between source location, perceived loudness, and loudness at the source

(page 21) is disclosed. By using TDOA analysis as disclosed by Bronstein, and using these results, one of ordinary skill in the art at the time of the invention could have easily seen to use the relationship of page 21 to determine the loudness at the source. Therefore using the information disclosed in Brandstein, one could easily determine the "absolute loudness" as required by the claimed invention.

6. With regards to applicant's, arguments, see Remarks page 9, that Gable does not disclose “absolute loudness,” this limitation is taught by and the rejection relies upon Brandstein.

7. With regards to applicant’s arguments, see Remarks page 10, that Lee and Brandstein cannot be properly combined, these arguments are moot in view of the new grounds of rejection.

Claim Objections

8. Claim 15 objected to because of the following informalities: “an” appears twice in the last line in error. Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 1, 2, 4-9, and 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Gable et al. (US PAP 2005/0060153) in view of Brandstein et al. (Microphone Array Localization Error Estimation with Application to sensor Placement).

11. Consider claim 1, Gable teaches a method for processing speech (abstract), comprising the steps of:

receiving a speech input of a speaker (figure 2, microphone 202; paragraph 0030),

generating speech parameters from said speech input (parameters extracted; paragraph 0027),

determining parameters describing an absolute loudness of said speech input (amplitude is determined; paragraph 0027),

evaluating said speech input and/or said speech parameters using said parameters describing the absolute loudness to identify the speaker (paragraph 0027-0029, parameters evaluated to verify a user identity.).

Gable does not specifically teach the absolute loudness being a loudness of the speech at a location of a source of the speech.

In the same field of speech processing, Brandstein suggests the absolute loudness being a loudness of the speech at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the

source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the absolute loudness as suggested by Brandstein with the speech system of Gable in order to provide a method of normalizing the loudness for speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

12. Consider claim 4, Gable does not, but Brandstein teaches a method according to claim 1 wherein a microphone array comprising a plurality of microphones (see figure 6) is used for determining said parameters describing the absolute loudness (Existing array systems have been used in a number of applications. These include teleconferencing, speech recognition, speaker identification, speech acquisition in an automobile environment, sound capture in reverberant enclosures, large room recordings, conferencing, acoustic surveillance, and hearing aid devices; page 1 lines 11-15. Obviously, the array of microphones would be used to determine the parameters including loudness needed for these applications.).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the multiple microphones as suggested by Brandstein with the speech system of Gable in order to provide a means of normalizing the loudness for

speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

13. Consider claim 5, Gable does not, but Brandstein teaches a method according to claim 1 wherein a location and/or distance of the speaker is determined (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5.).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the localization as suggested by Brandstein with the speech system of Gable in order to provide a means of normalizing the loudness for speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

14. Consider claim 6, Gable does not, but Brandstein teaches a method according to claim 1 wherein the absolute loudness is determined using algorithms for auditory and/or binaural processing (Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array.).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the source model as suggested by Brandstein with the speech system of Gable in order to provide a means of normalizing the loudness for speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

15. Consider claim 7, Gable does not, but Brandstein teaches a method according to claim 5, wherein said absolute loudness is computed by normalizing a measured loudness, or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the source. This relationship could obviously be used to normalize an amplitude value to estimate the amplitude at the source.).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the distance normaliztion as suggested by Brandstein with the speech system of Gable in order to provide a means of normalizing the loudness for speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

16. Consider claim 8, Gable does not, but Brandstein teaches a method according to claim 5, wherein said distance is determined using the time delay of the speech input

between said plurality of microphones (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.)

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the multiple microphones as suggested by Brandstein with the speech system of Gable in order to provide a means of normalizing the loudness for speaker verification to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

Consider claim 9, Gable teaches a speech processing system (abstract), configured to:

receive a speech input of a speaker (figure 2, microphone 202; paragraph 0030),

generate speech parameters from said speech input (parameters extracted; paragraph 0027),

determine parameters describing an absolute loudness of said speech input (amplitude is determined; paragraph 0027),

evaluate said speech input and/or said speech parameters using said parameters describing the absolute loudness to identify the speaker (paragraph 0027-0029, parameters evaluated to verify a user identity.).

Gable does not specifically teach the absolute loudness being a loudness of the speech at a location of a source of the speech.

In the same field of speech processing, Brandstein suggests the absolute loudness being a loudness of the speech at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the absolute loudness as suggested by Brandstein with the speech system of Gable in order to provide a method of normalizing the loudness for speaker detection to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

17. Consider claim 12, Gable teaches a computer readable medium encoded with a computer program configure to cause a processor based device to execute the method of (Abstract, computer figure 2 requires a program):

receiving a speech input of a speaker (figure 2, microphone 202; paragraph 0030),

generating speech parameters from said speech input (parameters extracted; paragraph 0027),

determining parameters describing an absolute loudness of said speech input (amplitude is determined; paragraph 0027),

evaluating said speech input and/or said speech parameters using said parameters describing the absolute loudness to identify the speaker (paragraph 0027-0029, parameters evaluated to verify a user identity.).

Gable does not specifically teach the absolute loudness being a loudness of the speech at a location of a source of the speech.

In the same field of speech processing, Brandstein suggests the absolute loudness being a loudness of the speech at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the absolute loudness as suggested by Brandstein with the speech system of Gable in order to provide a method of normalizing the loudness for speaker detection to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

18. Consider claim 13, Gable teaches a method for processing speech (Abstract, computer figure 2 requires a program), comprising:

receiving a speech signal of a speaker (figure 2, microphone 202; paragraph 0030);

generating speech parameters from said speech signal (parameters extracted; paragraph 0027); and

evaluating at least one of said speech signal and said speech parameters using the normalized loudness or energy to identify the speaker (paragraph 0027-0029, parameters evaluated to verify a user identity.).

However Gable does not specifically teach:

determining a distance of the speaker based on a time delay of a respective arrival of said speech signal at two or more microphones; and

normalizing a measured loudness or energy by said distance, and

calculating an absolute loudness being a loudness of a speech that generated the speech signal at a location of a source of the speech.

In the same field of speech processing, Brandstein teaches determining a distance of the speaker based on a time delay of a respective arrival of said speech signal at two or more microphones (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.); and

normalizing a measured loudness or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the

source. Although this relationship was given to model the source, one of ordinary skill in the art at the time of the invention would have thought, given the location of the source (as determined in the localization method discussed throughout Brandstein) and the detected amplitude at the microphone array, to use the relationship to determine the source amplitude) and

calculating an absolute loudness being a loudness of a speech that generated the speech signal at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array for source location and absolute volume as suggested by Brandstein with the speech processing system of Gable in order to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

19. Consider claim 14, Gable teaches a system for emotion recognition and/or speaker identification, comprising:

a data processor configured to generate speech parameters from said speech signal (parameters extracted; paragraph 0027), and

further configured to evaluate at least one of said speech signal and said speech parameters using the normalized loudness or energy to identify the speaker (paragraph 0027-0029, parameters including amplitude evaluated to verify a user identity.).

However Gable does not specifically teach:

at least two microphones configured to receive a speech signal; and

a processor configured to determine a distance of the speaker based on a time delay of a respective arrival of said speech signal at said microphone, to normalize a measured loudness or energy by said distance and calculating an absolute loudness being a loudness of a speech that generated the speech signal at a location of a source of the speech

In the same field of speech processing Brandstein teaches:

at least two microphones configured to receive a speech signal (see microphone array in figure 6); and

a processor configured to determine a distance of the speaker based on a time delay of a respective arrival of said speech signal at said microphone (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.), to normalize a measured loudness or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the source. Although this relationship was given to model the source, one of ordinary skill in the art at the time of the invention would have thought,

given the location of the source (as determined in the localization method discussed throughout Brandstein) and the detected amplitude at the microphone array, to use the relationship to determine the source amplitude) and calculating an absolute loudness being a loudness of a speech that generated the speech signal at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array for source location and absolute volume as suggested by Brandstein with the speech processing system of Gable in order to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

20. Consider claim 15, Gable teaches a method for processing speech (abstract) comprising the steps of:

receiving a speech signal of a speaker (figure 2, microphone 202; paragraph 0030);

calculating an absolute loudness (amplitude is determined; paragraph 0027);

determining features from the speech signal, wherein the features are at least partly based on the absolute loudness (amplitude is determined; paragraph 0027); and

determining an identity of the speaker based on the features (paragraph 0027-0029, parameters evaluated to verify a user identity.).

Gable does not specifically teach the absolute loudness being a loudness of the speech at a location of a source of the speech.

In the same field of speech processing, Brandstein suggests the absolute loudness being a loudness of the speech at a location of a source of the speech (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5. Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array).

Therefore it would have been obvious to one of ordinary skill in the art at the time if the invention to combine the absolute loudness as suggested by Brandstein with the speech system of Gable in order to provide a method of normalizing the loudness for emotion detection to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

21. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gable and Brandstein as applied to claim 1 above, and further in view of Lee et al. (Recognition of Negative Emotions from the Speech Signal).

22. Consider claim 2, Gable and Brandstein teaches a method according to claim 1, but does not specifically teach wherein the step of evaluation comprises a step of emotion recognition.

In the same field of speech processing, Lee teaches a step of emotion recognition (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; page 240, column 2, lines 3-4.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the emotion detection of Lee, with the system of Gables and Brandstein in order to properly classify emotional information that may affect speaker recognition and verification.

Conclusion

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS C. GODBOLD whose telephone number is (571)270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

10/16/2008

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Primary Examiner, Art Unit 2626

DCG